

ROSS ENVIRONMENTAL ASSOCIATES, INC.

Hydrogeology, Water Quality, GIS Planning,
Contaminant Fate & Transport, Remediation,
& Regulatory Compliance and Permitting



Initial Site Investigation Report

**Before Residence
420 School Street
West Burke, Vermont 05871**

**SMS Site #: 2005-3358
Site Coordinates: 44° 38' 50.4"N 71° 58' 54.9"W**

30 September 2005

Prepared For:

**Mr. Edmond Before
420 School Street
West Burke, Vermont 05871
*Phone: (802) 467-3030***

Prepared By:

**Ross Environmental Associates, Inc.
P.O. Box 1533
Stowe, Vermont 05672**

***Phone: (802) 253-4280
Fax: (802) 253-4258***

***R.E.A. Project No. 25-081
R.E.A. Document #: 25081ISI***

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EXECUTIVE SUMMARY

Ross Environmental Associates, Inc. (**R.E.A.**) has conducted an initial site investigation (ISI) at the Before Residence, located on School Street in West Burke, Vermont. Field investigation included: installation of five soil boring/monitoring wells, field screening of subsurface soil samples for the possible presence of volatile organic compounds (VOCs), sampling and analysis of water from five site monitoring wells plus the on-site supply well and one off-site supply well, and a receptor survey to identify potential risks to the environment and human health.

A total of five monitoring wells were installed as part of this investigation: MW-1 was installed on the eastern side of the UST excavation, MW-2 was installed in the area of the former pump island and MW-3 between the former USTs and the on-site supply well. Two monitoring wells (MW-4 and MW-5) were installed downgradient of the former USTs, on the adjacent properties to the west and south. No petroleum contamination was detected in any of the samples collected from the site monitoring wells; however, lead was detected above the VGES in the samples collected from MW-2, MW-3 and MW-4. No petroleum contamination was detected in the supply well samples collected from the on-site supply well (420 School Street) and Cark supply well (398 School Street).

Available information indicates that residual petroleum contamination identified during the UST closure is limited to the soil in the immediate vicinity of the former UST system, and that no sensitive receptors appear to be threatened or impacted at this time. Based on available information, active remediation is not likely to be required by the VT DEC.

On the basis of the results of this investigation, **R.E.A.** makes the following recommendations.

1. The site monitoring wells (MW-1, MW-2, MW-3, MW-4 and MW-5) should be re-sampled to confirm the findings of the initial sampling event. All samples should be analyzed for the possible presence of volatile petroleum compounds and lead in accordance with U.S. EPA Methods 8021B and 6010B.
2. A summary report should be submitted following the completion of the additional work, which should include recommendations for possible long-term monitoring or site closure.

SITE PROFILE

Site Information

Site Name:	Before Residence
SMS Site #:	2005-3358
Site Address:	420 School Street, West Burke, VT
Mailing Address:	420 School Street, West Burke, VT
Telephone:	(802) 467-3030
Contact/Owner:	Mr. Edmond Before
Coordinates:	latitude 44° 38' 50.4" N, and longitude 71° 58' 54.9" W.
Contaminants of Concern:	Petroleum, characteristic of gasoline
Source:	Former pump island piping system, removed in June 2005

Aquifer Characteristics

Soil Type:	The soils at the site consisted primarily of medium to coarse sand with some unsorted gravel and cobbles.
Effective Porosity:	0.4
Hydraulic conductivity:	0.5 to 57 ft/day
Ground-water flow direction:	west/southwest
Horizontal hydraulic gradient:	3.5 % (8/15/05)
Average ground water velocity:	0.05 to 4.9 ft/day
Ground-water depth bgs:	6-9 feet bgs
Saturated thickness:	>unknown
Depth to Bedrock:	> or = to 9.5 feet bgs

Receptors

Drinking water:	Private supply wells provide drinking water to the site and surrounding properties. No volatile petroleum compounds were detected in the samples collected from the on-site supply well or the nearest downgradient supply well serving the Clark residence.
Ground water:	No volatile petroleum compounds were detected in the samples collected from five site monitoring wells; however, lead was detected above the VGES in three monitoring wells (MW-2, MW-3 & MW-4); see Table 2, Appendix A.
Surface water:	The nearest surface water feature is the West Branch of the Passumpsic River, located approximately 200 feet west of the Site. No volatile petroleum compounds were detected in the ground water samples collected from the two downgradient monitoring wells situated between the former USTs and the River.
Buildings:	The house is constructed on a full basement. The basement is located cross gradient of the former USTs and is not likely to be impacted by the residual petroleum contamination.
Underground utilities:	The private septic system is located on the western side of VT Route 5 across the road from the residence. No other underground utilities are located in the vicinity of the former UST.

1.0 INTRODUCTION

On 15 June 2005, Mr. Edmond Before retained the services of **R.E.A.** to complete an initial site investigation (ISI) at the Before Residence in West Burke, Vermont in accordance with Vermont Department of Environmental Conservation (VT DEC) guidelines. The ISI was completed to address the presence of soil and groundwater contamination discovered during the 15 June 2005 UST removal. This report has been prepared by **R.E.A.** under the direction of Mr. Edmond Before; unauthorized use or reproduction of this report is prohibited, without written authorization from **R.E.A.**, or Mr. Edmond Before.

1.1 Site Location and Setting

The property, which is currently owned by Mr. Edmond Before, is occupied by a single family home with an attached garage. The property is located at 420 School Street in West Burke, Vermont (**Figure 1**, Appendix A). Drinking water for the Before residence is provided by a bedrock supply well, located on the southwestern side of the home, approximately 30 feet northwest of the former UST system. Wastewater disposal for the Before residence is provided by a private septic system located on the western side of VT Route 5, across from the residence.

The ground surface slopes moderately to the west-southwest, with an average elevation of approximately 990 feet above mean sea level (Maptech, 1998). The West Branch of the Passumpsic River is located approximately 200 feet west of the former UST system. The geographic coordinates of the site are: latitude 44° 38' 50.4" N, and longitude 71° 58' 54.9" W.

The surficial geology in the vicinity of the site is mapped as glaciofluvial deposits consisting of kame gravel and till deposits (Stewart and MacClintock, 1970). Bedrock in the area is mapped as the Waits River formation, which consists of gray quartzose and micaceous crystalline limestone of Lower Devonian age (Doll, 1961). No bedrock outcrops were observed on the site or adjacent properties.

An orthophotograph from 1999 showing the site and surrounding properties and photographs of the site and surrounding area taken during the initial site investigation are included in Appendix B.

1.2 Site History

According to Mr. Before, the UST system was installed by the previous property owner who operated a gravel hauling business on-site approximately 35 years ago. The tanks were used to store diesel fuel and gasoline for fueling trucks for the gravel hauling business. Mr. Before indicated that the tanks had been out-of-service for over 25 years.

On 15 June 2005, **R.E.A.** provided oversight for the removal of a two 1,000-gallon and one 550-gallon gasoline underground storage tanks (USTs) located approximately 40 feet southwest of the Before residence. The UST's was found to be in fair condition with some rust and pitting, but no visible holes or weeps.

Soils in the excavation consisted of medium and coarse sand with some unsorted gravel and cobbles from ground surface to approximately six feet below ground surface (bgs). PID readings on soil samples collected from the UST excavation ranged from 0.9 to 1060 ppmv, which are above the VT DEC action level of 20 ppmv for gasoline contaminated soil. The highest PID readings were obtained in the area directly beneath the former pump island, which was located just to the west of the excavation. Light sheening was noted on groundwater, which was encountered at approximately 8.5 feet bgs. The vertical and horizontal extent of contamination was not defined during the UST closure. Based on the findings of the UST closure, the subsurface petroleum contamination is most likely due to leaky pipes at the pump island system as indicated by dark staining of soil, which started approximately one foot beneath the pump island and extended to the bottom of the excavation, at approximately 8.5 feet.

1.3 Land Use and Adjacent Property Ownership

The subject property is located in a rural residential area of West Burke. The Before property is bordered on the north and south by private residences, and to the east by an undeveloped wooded area. Vermont Route 5A forms the western boundary with the Passumpsic River situated on the other side of Route 5A.

2.0 Field Investigation Results and Procedures

R.E.A.'s field investigation included: the installation of five soil boring/monitoring wells (MW-1, MW-2, MW-3, MW-4 and MW-5); field screening of subsurface soil samples for the possible presence of volatile organic compounds (VOCs) using a portable photo-ionization detector (PID); collection and analysis of water samples from five site monitoring wells and two drinking water supply wells, and a receptor survey to identify potential risks to the environment and human health. Approximate monitoring well/soil boring locations and significant site features are shown on **Figure 2** in Appendix A.

The objectives of this initial site investigation were to:

- Evaluate the degree and extent of petroleum contamination in soils and ground water;
- Qualitatively assess the risks to environmental and public health via relevant sensitive receptors and potential contaminant migration pathways.
- Identify the need for further site characterization, appropriate monitoring, and/or remedial actions based on the site conditions.

2.1 Contaminants of Concern

Based on available information, the contaminants of concern (COC) at the Before Residence appear to be volatile petroleum compounds and lead. These contaminants are typically associated with gasoline. Leaded gasoline was used prior to 1995, when the Environmental Protection Agency (EPA) banned the use of all leaded gasoline. Lead was a constituent of tetra-ethyl lead, which was used as a cure for engine knock in automobiles.

2.2 Source Area Evaluation

Based on available information, the source of petroleum contamination discovered at the Before residence is the former UST system, specifically the pump islands piping system. The USTs were found to be in fair condition with surface rust and pitting, but no visible holes or weeps. The source of lead in ground water has not been definitively determine, but could be related to historical use of leaded gasoline, run-off from nearby roadways, or natural soil deposits. No up-gradient sources of petroleum or lead contamination were identified during the ISI.

2.3 Soil Boring and Monitoring Well Installation

On 8 August 2005, *R.E.A.* provided oversight during the installation of five monitoring wells, three of which were installed in the presumed downgradient direction from the former UST system, one was installed up-gradient and one was installed up-gradient, between the UST excavation and the

Before supply well. The soils at the site consisted primarily of brown and dark brown fine and medium sand with some gravel. The soil borings for MW-1, MW-2, MW-3, MW-4 and MW-5 were extended to at least two feet below the water table, which was encountered at between six to nine feet bgs at the time of drilling. The soil borings for MW-1, MW-4 and MW-5 extended to approximately 10.5 feet bgs. The MW-2 and MW-3 soil borings were completed to approximately 9 and 12 feet bgs, respectively.

All of the monitoring wells were constructed using 1.0-inch-diameter schedule 40 polyvinyl chloride (PVC) with flush threaded joints and 0.01-inch factory-slotted well screens. MW-2, MW-4 and MW-5 were completed with seven-foot well screens. MW-1 was completed with an eight-foot well screen and MW-3 was completed with a ten-foot well screen. Solid PVC risers, extending to ground surface, were used to complete each well. A clean sand pack was placed around the screened section of each monitoring well extending one to two feet above the top of the screen, with a bentonite seal placed above the sand pack. Flush-mounted road-box protective casings were installed over each monitoring well. Each well was developed after installation by removing eight to ten standing volumes of water using a peristaltic pump. Soil descriptions and monitoring well construction details are included on the soil boring logs in Appendix C. Expedition Drilling, Inc. of Atkinson, New Hampshire installed the soil borings and monitoring wells under direct supervision of **R.E.A.**

Photo-ionization detector (PID) readings on soil samples collected from all of the soil borings ranged between 0.0 and 15.6 ppmv, indicating the absence of widespread contamination. The highest PID readings were generally obtained on the soil samples collected at or just below the water table in each soil boring. PID screening results are included on the soil boring logs in Appendix C. **R.E.A.**'s environmental scientist screened soil samples from the soil borings for the possible presence of volatile organic compounds (VOCs) using a RAE miniRAE 2000 portable PID. The PID was calibrated with an isobutylene standard gas to a benzene reference on the day of drilling.

After installation of the soil boring/monitoring wells, **R.E.A.** surveyed the locations of the boring/wells in relation to existing site features. Each boring/well was located in azimuth to an accuracy of ± 1.0 feet, and in elevation with an accuracy of ± 0.01 feet relative to an on-site benchmark of 100.00 feet (MW-3).

2.4 Ground Water Elevations and Flow Direction

On 15 August 2005, ground-water flow in the unconfined surficial aquifer at the site was toward the west/southwest with an estimated hydraulic gradient of approximately 3.5 percent. Water-level measurements and elevation calculations for 15 August 2005, are presented in **Table 1** and the ground-water contour map prepared using this data is presented as **Figure 3**, Appendix A.

Static water-table elevations were computed for each monitoring well by subtracting measured depth-to-water readings from the surveyed top-of-casing (TOC) elevations, which are relative to an arbitrary site datum of 100.00 feet (MW-3).

The effective porosity of the predominantly medium to coarse sand encountered below the water-table is presumably around 0.4, with hydraulic conductivities of 0.5 to 57 feet per day (Freeze & Cherry, 1979). Assuming Darcian flow, these estimates combine with the calculated horizontal gradient of 3.5 percent to yield an estimated range of ground-water flow velocities of between 0.05 to 4.9 feet per day. Contaminant migration would be less accounting for retardation and dispersion of the contaminants.

2.5 Ground Water Sampling and Analysis

At this time, ground water in the immediate vicinity and down-gradient of the former UST or pump island system does not appear to be impacted by petroleum contamination. No volatile organic compounds (VOCs) or total petroleum hydrocarbons (TPH) were detected in any of the water samples collected from the five site monitoring wells. Low concentrations of lead were detected in the samples collected from MW-2, MW-3 and MW-4 at concentrations ranging between 17.4 and 58.4 micrograms per liter (ug/L), which exceed the Vermont Ground Water Enforcement Standard (VGESs)¹. The source of lead in ground water has not been definitively determine, but could be related to historical use of leaded gasoline, run-off from nearby roadways, or natural soil deposits. At this time, the extent of subsurface petroleum contamination appears to have been adequately defined and no downgradient sensitive receptors appear to be impacted or threatened by residual petroleum contamination.

No petroleum compounds were detected in the trip-blank sample, and the duplicate sample results (MW-2) were within the EPA recommended percentage difference of 30 percent. The analytical results are summarized on **Table 2**, and copies of the laboratory analytical reports are included as

¹The Vermont DEC has established groundwater enforcement standards for eight petroleum related VOCs, as follows: benzene - 5 ug/L; toluene - 1,000 ug/L; ethylbenzene - 700 ug/L; xylenes - 10,000 ug/L; MTBE - 40 ug/L; 1,3,5-trimethyl benzene – 4 ug/L; 1,2,4-trimethyl benzene – 5 ug/L; naphthalene – 20 ug/L; and lead – 15 ug/L.

Appendix D. Contaminant distribution, based on samples collected on 15 August 2005, is shown on **Figure 4** in Appendix A.

Prior to sample collection, **R.E.A** field personnel measured the water level in each monitoring well and purged approximately three to five standing volumes of water from each well. All monitoring well samples were collected by pouring water directly into 40-milliliter glass vials with teflon-lined septum lids. The groundwater was transferred to the 40-millimeter glass vials, by means of a peristaltic pump and clear flexible tubing dedicated to each well. Each sample vial was preserved with hydrochloric acid to reduce the pH to less than 2 standard units (su).

Immediately after sample collection, field measurements were obtained for pH, specific conductivity, temperature, total dissolved solids (TDS), and oxygen reduction potential (ORP). A summary of the field measurement data is included on **Table 3**, in Appendix A.

On 15 August 2005, ground water samples were collected from five monitoring wells (MW-1, MW-2, MW-3, MW-4 and MW-5). All ground water samples were analyzed for the possible presence of volatile organic compounds and total petroleum hydrocarbons (TPH) in accordance with U.S. EPA Methods 8260 and 8015-gasoline range organics (GRO), respectively. In addition, water samples collected from MW-2, MW-3 and MW-4 were analyzed for the possible presence of lead in accordance with EPA Method 6010B. All samples were transported under chain-of-custody in an ice-filled cooler to AMRO Environmental Laboratories Corporation of Merrimack, New Hampshire for laboratory analysis.

2.6 Supply Well Sampling and Analysis

No volatile organic compounds were detected in the drinking water supply well samples from the Before (420 School Street) and Clark (398 School Street) residences. The drinking water samples were collected by filling 40-milliliter glass vials directly from the kitchen faucet after allowing the water to run for approximately 10 minutes. Each sample vial was preserved with hydrochloric acid to reduce the pH to less than 2 standard units (su).

On 8 August 2005, the Before and Clark drinking water supply wells were sampled and analyzed for the possible presence of volatile organic compounds in accordance with U.S. EPA Method 524.2. Both supply well samples were transported under chain-of-custody in an ice-filled cooler to Endyne, Inc. of Williston, Vermont for laboratory analysis.

2.7 Investigation Procedures

The procedures used during the initial site investigation at the Before residence are consistent with the following guidance documents:

- *“Underground Storage Tank Closure and Site Assessment Requirements.”* Vermont Agency of Natural Resources, Waste Management Division. November 1997.
- *“Site Investigation Guidance.”* Vermont Agency of Natural Resources, Waste Management Division. August 1996.
- *“Corrective Action Guidance.”* Vermont Agency of Natural Resources, Waste Management Division. November 1997.
- *“Agency Guidelines for Petroleum Contaminated Soil and Debris.”* Vermont Agency of Natural Resources, Waste Management Division. August 1996.
- ASTM D 2488-93. *“Standard Practice for Description and Identification of Soils (Visual-Manual Procedure).”* American Society for Testing and Materials.
- ASTM D 5092-90. *“Standard Practice for Design and Installation of Ground Water Monitoring Wells in Aquifers.”* American Society for Testing and Materials.
- ASTM D 4750-87. *“Standard Test Method for Determining Subsurface Liquid Levels in a Borehole or Monitoring Well.”* American Society for Testing and Materials.
- ASTM D 4448-85a. *“Standard Guide for Sampling Ground Water Monitoring Wells.”* American Society for Testing and Materials.

3.0 SENSITIVE RECEPTOR IDENTIFICATION AND RISK ASSESSMENT

Based on available information, no sensitive receptors appear to be threatened or impacted by the residual petroleum contamination located in the vicinity of the former UST system.

3.1 Receptor Identification

The following sensitive receptors were identified in the vicinity of the subject property.

- Soils and groundwater within the general vicinity of the former UST system.
- The Before bedrock drinking water supply well (420 School Street), located approximately 40 feet northeast of the former UST system.
- The Clark bedrock drinking water supply well (398 School Street), located approximately 100 feet southwest of the former UST system.
- Indoor air in the basement of the Before basement. Located xx feet northwest of the former UST system.
- The West Branch of the Passumpsic River, located approximately 200 feet west of the former UST system.

3.2 Risk Assessment

On the basis of the information obtained during this investigation, **R.E.A.** has qualitatively assessed the risks that the subsurface contamination poses to human health and the environment. The findings are summarized as follows:

- The shallow overburden groundwater formation within the immediate vicinity of the former UST has not been impacted by petroleum contamination, based on the results of the ground water sampling event conducted on 15 August 2005.
- Neither bedrock supply wells has been impacted by petroleum contamination; no volatile organic compounds were detected in the supply well samples collected on 8 August 2004.
- PID readings of indoor air in the basement of the Before residence were approximately 0.5 ppmv, which is within the typical range for background readings.
- The West Branch of the Passumpsic River is not likely to be impacted by petroleum contamination; no volatile petroleum compound were detected in the ground water samples collected from monitoring wells MW-4 and MW-5, which are situated between the former UST and the West Branch of the Passumpsic River. Also, no seeps or visible evidence of a petroleum release were noted along the River bank.

4.0 DATA EVALUATION AND REGULATORY STATUS

Groundwater sampling results from 15 August 2005 indicate that the underlying ground water formation has not been impacted by petroleum contamination; however, lead was detected above the VGES in three monitoring wells. The source of lead in ground water has not been determine, but could be related to historical use of leaded gasoline, run-off from nearby roadways, or natural soil deposits. No sensitive receptors appear to be impacted by residual contamination at this time.

Based on available information, active remediation at the site is not likely to be required by the VT DEC. Generally, the VT DEC requires active remediation when greater than 1/8" of free-product is present, or when human health or a sensitive receptor is impacted or threatened by contamination. The VT DEC may require another round of monitoring of ground water beneath the site to confirm the initial results.

A summary of the significant findings of the ISI is outlined below:

- The VGES for lead was exceeded in the samples collected from MW-2, MW-3 and MW-4. No other VGESs were exceeded during the August 2005 sampling event
- No volatile organic compounds or total petroleum hydrocarbons were detected in the groundwater samples collected from MW-1, MW-2, MW-3, MW-4 and MW-5 during the 15 August 2005 sampling event.
- No volatile organic compounds were detected in the Before (420 School Street) and the Clark (398 School Street) supply well samples collected on the 8 August 2005.
- PID readings on soil samples collected during the completion of soil borings ranged from 0.0 to 15.6 ppm, which are below the VT DEC guideline of 20.0 ppm for gasoline contaminated soils.
- Ground water in the shallow overburden formation appears to flow primarily toward the west/southwest, which is consistent with site topography and the location of the river.

5.0 RECOMMENDATIONS

On the basis of the results of this investigation and the conclusions stated above, **R.E.A.** makes the following recommendations.

1. The on-site monitoring wells (MW-1, MW-2, MW-3, MW-4 and MW-5) should be re-sampled to confirm the findings of the initial sampling event. All samples should be analyzed for the possible presence of volatile petroleum compounds (VOCs) and lead in accordance with U.S. EPA Methods 8260 and 610B, respectively.
2. A summary report should be submitted following the completion of the additional work, which should include recommendations for possible long-term monitoring or site closure.

6.0 LIMITATIONS

This report was completed by **Ross Environmental Associates, Inc. (R.E.A.)** for the sole use of Mr. Edmond Before in connection with an assessment of on-site environmental conditions. Use of this report by any other person or for any other use is not authorized except with prior written consent of **R.E.A.** or Mr. Edmond Before.

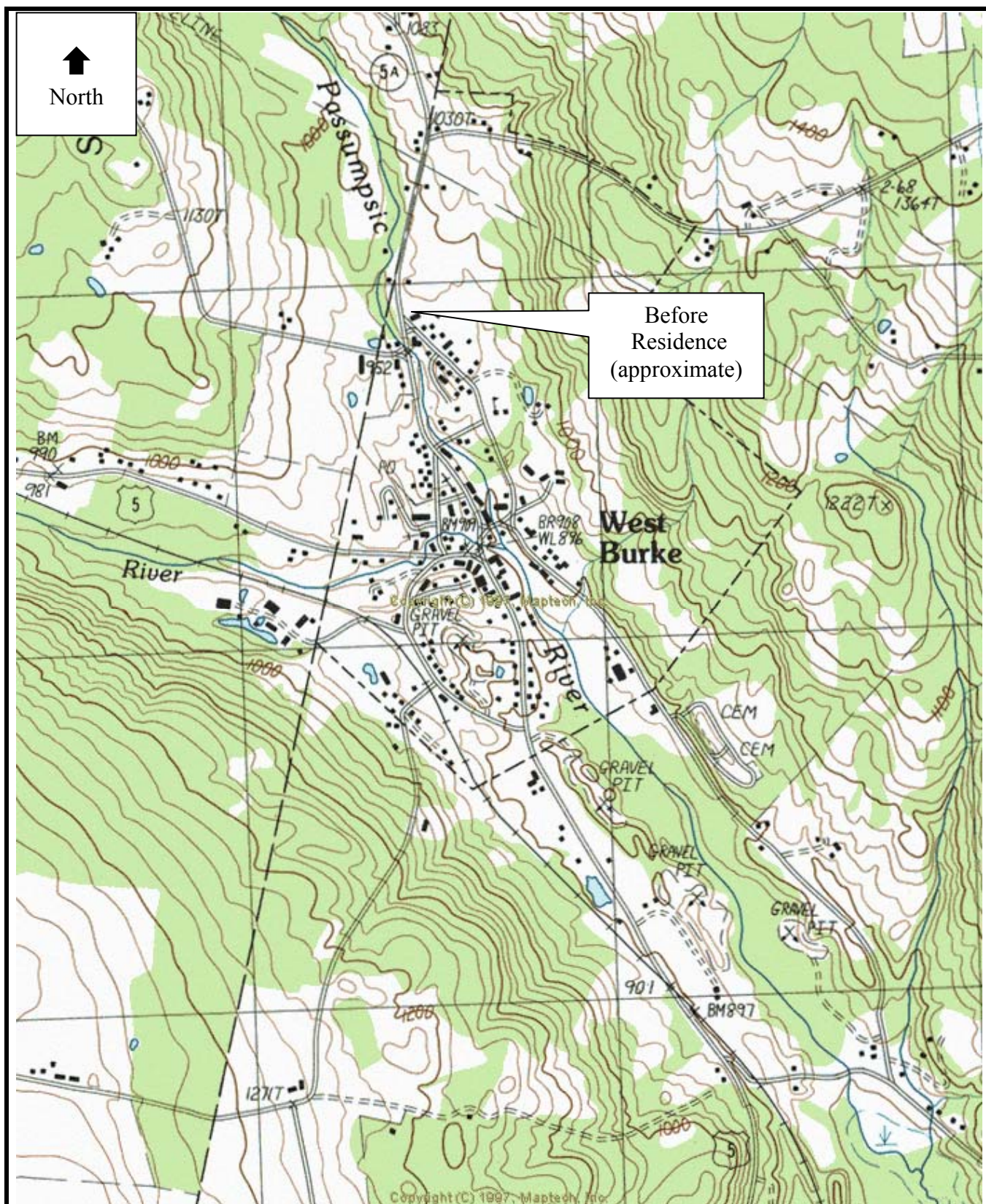
The work was undertaken to assess environmental conditions specifically on the subject property in accordance with generally accepted engineering and hydrogeological practices. No other warranty, express or implied, is made. Absolute assurance that any and all possible contamination at the site was identified cannot be provided.

The report conclusions are based, in part, on information provided by the client, their agents, or third parties, including state or local officials. **R.E.A.** assumes no responsibility for the accuracy and completeness of the information. Where visual observations are included in the report, they represent conditions at the time of the inspection, and may not be indicative of past or future site conditions.

7.0 REFERENCES

- Doll, C.G. and others, 1961. "Geologic Map of Vermont", Office of the State Geologist.
- Freeze, R. A., and Cherry, J.A., 1976. *Groundwater*, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 29 p.
- Fetter, C.W., 1994. *Applied Hydrogeology, 3rd Ed.*, Prentice Hall, Englewood Cliffs, New Jersey, 98 p.
- Stewart, D.P. and MacClintock, P., 1970. "Surficial Geologic Map of Vermont", Office of the State Geologist.
- Maptech, 1998. West Burke Quadrangle Vermont. U.S. Geological Survey. 7.5 minute series (topographic), Provisional Edition., 1988. Maptech, Inc. Greenland, NH. 1998.

ATTACHMENT A



Approximate Scale: 1 inch = 1,400 feet

Site Coordinates: 44° 38' 50.93"N, 071° 58' 56.08" W

Source: USGS 1988. West Burke Quadrangle VT.
Provisional Edition 1988. Topographic map
(7.5 minute series). Maptech, Inc. 1998.
R.E.A. Project No. 25-081

Figure 1
Site Location Map
Before Residence
West Burke, Vermont



Rt.5A

Before Residence

Ⓢ (Approx.)

MW-3

MW-5

Former Pump Island

Former USTs

MW-2

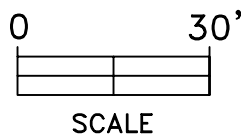
MW-1

MW-4

School Street

Clark Supply Well
(Approx. 100 feet)

Ⓢ



ALL LOCATIONS ARE APPROXIMATE

Ross Environmental Associates, Inc.

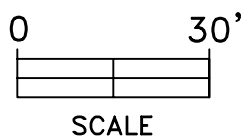
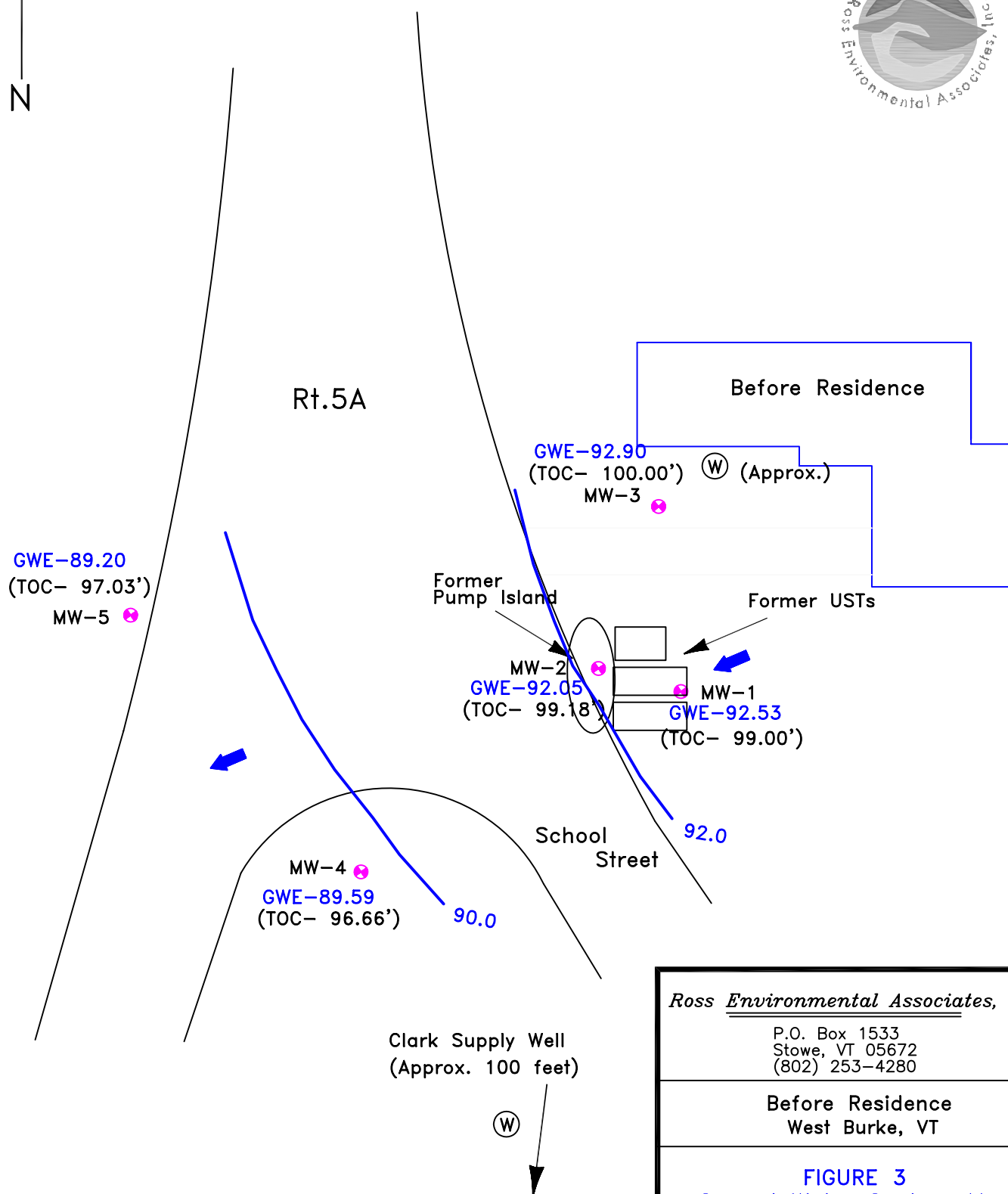
P.O. Box 1533
Stowe, VT 05672
(802) 253-4280

Before Residence
West Burke, VT

FIGURE 2
Site Plan

LEGEND: Ⓢ Monitoring Well Location
Ⓢ Supply Well

DRAWN BY: MDH	DATE: September 28, 2005
APPROVED BY: BR	FILE No.: 25-081



GWE - ground water elevation, in feet.
 TOC - top of casing elevation, in feet.
 ASSUMED ELEV. 100.00'
 ALL LOCATIONS ARE APPROXIMATE

Ross Environmental Associates, Inc.

P.O. Box 1533
 Stowe, VT 05672
 (802) 253-4280

Before Residence
West Burke, VT

FIGURE 3
Ground Water Contour Map
Monitoring Date: 15 August 2005

LEGEND: Monitoring Well Location
 Supply Well
 GROUND-WATER CONTOUR

DRAWN BY: MDH	DATE: September 28, 2005
APPROVED BY: BR	FILE No.: 25-081



Rt.5A

Before Residence

VOCs - ND
TPH - ND
Lead - 36.4

Ⓜ (Approx.)

VOCs - ND

MW-3

Former Pump Island

Former USTs

MW-2

VOCs - ND
TPH - ND
Lead - 17.4

MW-1

VOCs - ND
TPH - ND
Lead - 58.4

MW-5

VOCs - ND
TPH - ND

School Street

MW-4

VOCs - ND
TPH - ND

Clark Supply Well
(Approx. 100 feet)

VOCs - ND

Ⓜ

VOCs - total volatile organic compounds,
reported in ug/L.

TPH - total petroleum hydrocarbons,
reported in mg/L.

Lead - total lead, reported in ug/L.

ND - NONE DETECTED

ALL LOCATIONS ARE APPROXIMATE

Ross Environmental Associates, Inc.

P.O. Box 1533
Stowe, VT 05672
(802) 253-4280

Before Residence
West Burke, VT

FIGURE 4.
CONTAMINANT DISTRIBUTION MAP
MONITORING DATE: 15 August 2005

LEGEND: Ⓜ Monitoring Well Location
Ⓜ Supply Well

DRAWN BY: MDH

DATE: September 28, 2005

APPROVED BY: BR

FILE No.: 25-081

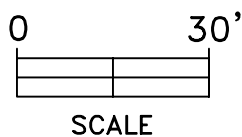


TABLE 1
GROUND WATER ELEVATION CALCULATIONS

Before Residence
West Burke, Vermont

Monitoring Date: 15 August 2005

Well I.D.	Top of Casing Elevation (ft)	Depth to Water (feet, TOC)	Water Table Elevation (ft)
MW-1	99.00	6.47	92.53
MW-2	99.18	7.13	92.05
MW-3	100.00	7.10	92.90
MW-4	96.66	7.07	89.59
MW-5	97.03	7.83	89.20

All values reported in feet relative to arbitrary site datum of 100.00 feet

TABLE 2
GROUND-WATER ANALYTICAL RESULTS

Before Residence
West Burke, Vermont

Monitoring Dates: 15 August 2005

Sample ID	MTBE	Benzene	Toluene	Ethyl benzene	Total Xylenes	1,3,5 TMB	1,2,4 TMB	Napthalene	Total VOCs	TPH (mg/L)	Lead (ug/L)
MW-1	ND<2.0	ND<1.0	ND<1.0	ND<1.0	ND<2.0	ND<1.0	ND<1.0	ND<1.0	ND	ND<0.10	---
MW-2	ND<2.0	ND<1.0	ND<1.0	ND<1.0	ND<2.0	ND<1.0	ND<1.0	ND<1.0	ND	ND<0.10	58.4
MW-3	ND<2.0	ND<1.0	ND<1.0	ND<1.0	ND<2.0	ND<1.0	ND<1.0	ND<1.0	ND	ND<0.10	17.4
MW-4	ND<2.0	ND<1.0	ND<1.0	ND<1.0	ND<2.0	ND<1.0	ND<1.0	ND<1.0	ND	ND<0.10	36.4
MW-5	ND<2.0	ND<1.0	ND<1.0	ND<1.0	ND<2.0	ND<1.0	ND<1.0	ND<1.0	ND	ND<0.10	---
VGES	40	5.0	1,000	700	10,000	4.0	5.0	20	--	--	15
MW-2	ND<2.0	ND<1.0	ND<1.0	ND<1.0	ND<2.0	ND<1.0	ND<1.0	ND<1.0	ND	ND<0.10	---
Dup, MW-2	ND<2.0	ND<1.0	ND<1.0	ND<1.0	ND<2.0	ND<1.0	ND<1.0	ND<1.0	ND	ND<0.10	---
% Difference	--	--	--	--	--	--	--	--	---	---	---
Trip Blank	ND<2.0	ND<1.0	ND<1.0	ND<1.0	ND<2.0	ND<1.0	ND<1.0	ND<1.0	ND	ND<0.10	---
VGES	40	5.0	1,000	700	10,000	4.0	5.0	20	--	--	--

All results reported in micrograms per liter (ug/L) unless indicated otherwise.

ND: Not detected at indicated detection limit.

UIP: Unidentified Peaks

Groundwater Enforcement Standard of 600 ug/L

All samples analyzed for the possible presence of VOCs in accordance with EPA Method 8260.

TABLE 3
FIELD MEASUREMENT DATA

Before Residence
West Burke, Vermont

Monitoring Date: 15 August 2005

Well ID	pH (su)	temperature (°C)	Specific conductivity (uS)	ORP (mV)	TDS (ppm)	Comments
MW-1	6.59	13.9	386.8	37	255.5	
MW-2	7.06	16.4	343.8	40	225.4	
MW-3	7.18	11.1	348.0	59	226.8	
MW-4	7.12	15.9	897.3	73	606.4	
MW-5	7.64	16.1	595.4	-28	400.3	

pH reported in standard units (s.u.).


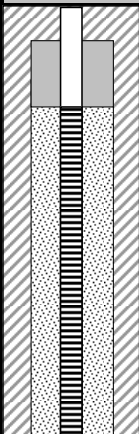







Specific conductivity reported in microsiemens (uS) or millisiemens (mS).


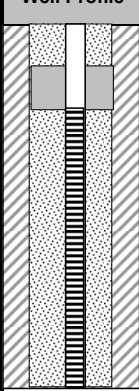







Oxidation-reduction potential (ORP) reported in millivolts (mV).


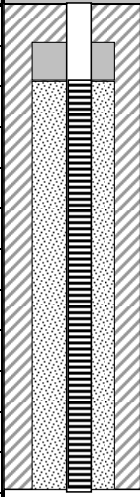

Total dissolved solids (TDS) reported in parts per million (ppm) or parts per (ppt) thousand.


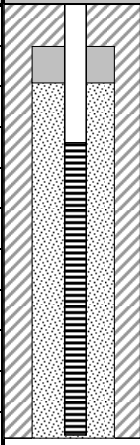







ATTACHMENT B


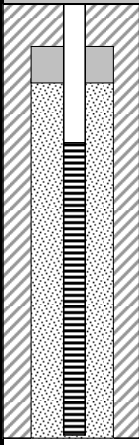







ATTACHMENT

				BORING / WELL IDENTIFICATION: MW-1		
				Site Name: Before Residence		
				Site Location: West Burke, Vermont		
Well Depth: 10.5'		Boring Depth: 10.5'		Installation Date: 8-Aug-05		
Depth to Water (during drilling): 6'				Job Number: 25-081		
Screen Diameter: 1"		Depth: 2.5-10.5'		REA Representative: Ross/Gascoyne		
Screen Type/Size: 0.01' slotted schedule 40 PVC				Drilling Company: Expedition Drilling		
Riser Diameter: 1"		Depth: 0-2.5'		Sampling Method: Geoprobe		
Riser Type/Size: Schedule 40 PVC				Reference Point (RP):		
Depth (ft)	Sample Depth (ft)	Blows/6" and Recovery (in)	Sample Description / Notes	PID (ppm)	Well Profile	Legend
1	0-4		Dark brown fine sand and silt. No odors.			 Concrete
2				0.4		 Native Material
3						
4				0.9		
5	4-8					 Bentonite
6	▼		Dark brown and iron stained fine sands and silt. No odors.			 Filter Sand
7						
8				1.0		
9	8-12		Medium and fine sand with silt and some gravel. Well set at 10.5' bgs. Refusal encountered due to presumed bedrock.			 Riser
10						
11	-----			0.3		 Screen
12						
13						 Water Level
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
PROPORTIONS USED		BLOW COUNT (COHESIVE SOILS)		BLOW COUNT (GRANULAR SOILS)		NOTES:
AND 33-50%	LITTLE 10-20%	<2 VERY SOFT	8-15 STIFF	0-4 VERY LOOSE	30-50 DENSE	miniRAE 2000
SOME 20-33%	TRACE 0-10%	2-4 SOFT	15-30 VERY STIFF	4-10 LOOSE	>50 VERY DENSE	
		4-8 MEDIUM STIFF	>30 HARD	10-30 MEDIUM DENSE		

				BORING / WELL IDENTIFICATION: MW-2			
				Site Name: Before Residence			
				Site Location: West Burke, Vermont			
Well Depth: 9.5'	Boring Depth: 9.5'	Installation Date: 8-Aug-05					
Depth to Water (during drilling): 8'		Job Number: 25-081					
Screen Diameter: 1"	Depth: 2-9'	REA Representative: Ross/Gascoyne					
Screen Type/Size: 0.01' slotted schedule 40 PVC		Drilling Company: Expedition Drilling					
Riser Diameter: 1"	Depth: 0-2'	Sampling Method: Geoprobe					
Riser Type/Size: Schedule 40 PVC		Reference Point (RP):					
Depth (ft)	Sample Depth (ft)	Blows/6" and Recovery (in)	Sample Description / Notes	PID (ppm)	Well Profile	Legend	
1	0-4		Oxidized Medium and fine sands with gravel.			 Concrete	
2						 Native Material	
3							
4				1.1			 Bentonite
5	4-8		Same as above. No Odors				 Filter Sand
6							
7				1.9			
8	▼						 Riser
9	8-12		Same as above, wet. No Odors. Well set at 9.5' bgs. Refusal encountered due to presumed bedrock.				 Screen
10	-----			12.6			
11							 Water Level
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
PROPORTIONS USED		BLOW COUNT (COHESIVE SOILS)		BLOW COUNT (GRANULAR SOILS)		NOTES:	
AND 33-50%	LITTLE 10-20%	<2 VERY SOFT	8-15 STIFF	0-4 VERY LOOSE	30-50 DENSE	miniRAE 2000	
SOME 20-33%	TRACE 0-10%	2-4 SOFT	15-30 VERY STIFF	4-10 LOOSE	>50 VERY DENSE		
		4-8 MEDIUM STIFF	>30 HARD	10-30 MEDIUM DENSE			

				BORING / WELL IDENTIFICATION: MW-3		
				Site Name: Before Residence		
				Site Location: West Burke, Vermont		
Well Depth: 12'		Boring Depth: 12'		Installation Date: 8-Aug-05		
Depth to Water (during drilling): 8'				Job Number: 25-081		
Screen Diameter: 1"		Depth: 2-12'		REA Representative: Ross/Gascoyne		
Screen Type/Size: 0.01' slotted schedule 40 PVC				Drilling Company: Expedition Drilling		
Riser Diameter: 1"		Depth: 0-2'		Sampling Method: Geoprobe		
Riser Type/Size: Schedule 40 PVC				Reference Point (RP):		
Depth (ft)	Sample Depth (ft)	Blows/6" and Recovery (in)	Sample Description / Notes	PID (ppm)	Well Profile	Legend
1	0-4		Oxidized medium sand and gravel. No odors.			 Concrete
2						
3						
4				8.7		
5	4-8		Medium and fine sand and silt with weathered			
6						
7						
8	▼		schist. No odors. Wet at 8' bgs	10.5		
9	8-12		Medium dark sand with some oxidation and			
10			some silt and gravel. No odors.	2.2		
11						
12				2.7		
13	12-16		Well set at 12' bgs. Refusal encountered due to presumed bedrock			
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
PROPORTIONS USED		BLOW COUNT (COHESIVE SOILS)		BLOW COUNT (GRANULAR SOILS)		NOTES:
AND 33-50%	LITTLE 10-20%	<2 VERY SOFT	8-15 STIFF	0-4 VERY LOOSE	30-50 DENSE	miniRAE 2000
SOME 20-33%	TRACE 0-10%	2-4 SOFT	15-30 VERY STIFF	4-10 LOOSE	>50 VERY DENSE	
		4-8 MEDIUM STIFF	>30 HARD	10-30 MEDIUM DENSE		

				BORING / WELL IDENTIFICATION: MW-4		
				Site Name: Before Residence		
				Site Location: West Burke, Vermont		
Well Depth: 10.5'		Boring Depth: 10.5'		Installation Date: 8-Aug-05		
Depth to Water (during drilling): 8'				Job Number: 25-081		
Screen Diameter: 1"		Depth: 3.5-10.5'		REA Representative: Ross/Gascoyne		
Screen Type/Size: 0.01' slotted schedule 40 PVC				Drilling Company: Expedition Drilling		
Riser Diameter: 1"		Depth: 0-3.5'		Sampling Method: Geoprobe		
Riser Type/Size: Schedule 40 PVC				Reference Point (RP):		
Depth (ft)	Sample Depth (ft)	Blows/6" and Recovery (in)	Sample Description / Notes	PID (ppm)	Well Profile	Legend
1	0-4		Dark brown fine sand w/some gravel. No			 Concrete
2						 Native Material
3						 Bentonite
4			odors.	8.4		 Filter Sand
5	4-8		Dark and light brown sand w/some gravel			 Riser
6				3.5		 Screen
7						 Water Level
8	▼			6.5		
9	8-12		Medium brown sand w/a band of coarse gravel.			
10			Well set at 10.5' bgs. Refusal encountered due to presumed bedrock.			
11	-----			2.2		
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
PROPORTIONS USED		BLOW COUNT (COHESIVE SOILS)		BLOW COUNT (GRANULAR SOILS)		NOTES:
AND 33-50%	LITTLE 10-20%	<2 VERY SOFT	8-15 STIFF	0-4 VERY LOOSE	30-50 DENSE	miniRAE 2000
SOME 20-33%	TRACE 0-10%	2-4 SOFT	15-30 VERY STIFF	4-10 LOOSE	>50 VERY DENSE	
		4-8 MEDIUM STIFF	>30 HARD	10-30 MEDIUM DENSE		

				BORING / WELL IDENTIFICATION: MW-5			
				Site Name: Before Residence			
				Site Location: West Burke, Vermont			
Well Depth: 10.5'		Boring Depth: 10.5'		Installation Date: 8-Aug-05			
Depth to Water (during drilling): 9'				Job Number: 25-081			
Screen Diameter: 1"		Depth: 3.5-10.5'		REA Representative: Ross/Gascoyne			
Screen Type/Size: 0.01' slotted schedule 40 PVC				Drilling Company: Expedition Drilling			
Riser Diameter: 1"		Depth: 0-3.5'		Sampling Method: Geoprobe			
Riser Type/Size: Schedule 40 PVC				Reference Point (RP):			
Depth (ft)	Sample Depth (ft)	Blows/6" and Recovery (in)	Sample Description / Notes	PID (ppm)	Well Profile	Legend	
1	0-4		Dark brown medium sand w/some gravel.			 Concrete	
2						 Native Material	
3							
4			No odors.	3.3			 Bentonite
5	4-8		Fine and medium brown sand w/some gravel.				 Filter Sand
6							
7							
8			Slight odor	15.6			 Riser
9	8-12 ▼		Dark fine sand w/alternating oxidized bands (some almost vertical). Well set at 10.5' bgs.				
10			Refusal encountered due to presumed bedrock.				 Screen
11	-----			0.0			
12							
13							 Water Level
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
PROPORTIONS USED		BLOW COUNT (COHESIVE SOILS)		BLOW COUNT (GRANULAR SOILS)		NOTES:	
AND 33-50%	LITTLE 10-20%	<2 VERY SOFT	8-15 STIFF	0-4 VERY LOOSE	30-50 DENSE	miniRAE 2000	
SOME 20-33%	TRACE 0-10%	2-4 SOFT	15-30 VERY STIFF	4-10 LOOSE	>50 VERY DENSE		
		4-8 MEDIUM STIFF	>30 HARD	10-30 MEDIUM DENSE			

ATTACHMENT



ENDYNE, INC.

Laboratory Services

160 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

Ross Environ. Assoc., Inc.
PO Box 1533, 96 Taber Hill Rd
Stowe, VT 05672
Attn: Bob Ross

PROJECT: Before UST/25-081
ORDER ID: 39100
RECEIVE DATE: August 9, 2005
REPORT DATE: August 12, 2005

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Different groups of analyses may be reported under separate cover.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

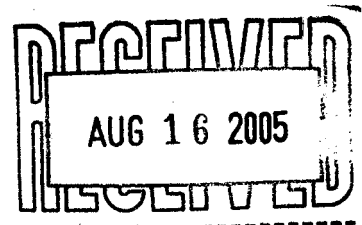
Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy was monitored by laboratory control standards which include matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits, unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures





ENDYNE, INC.

Laboratory Services

160 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA 524.2

CLIENT: Ross Environ. Assoc., Inc.
PROJECT: Before UST/25-081
SITE: 393 School St
DATE RECEIVED: August 9, 2005
REPORT DATE: August 12, 2005
ANALYSIS DATE: August 10, 2005

ORDER ID: 39100
REFERENCE NUMBER: 257784
DATE SAMPLED: August 8, 2005
TIME SAMPLED: 9:35 AM
SAMPLER: BR/JG
ANALYST: 725

<u>Parameter</u>	<u>Result</u> <u>ug/L</u>	<u>Parameter</u>	<u>Result</u> <u>ug/L</u>
Benzene	< 0.5	Isopropylbenzene	< 0.5
Bromobenzene	< 0.5	4-Isopropyltoluene	< 0.5
Bromomethane	< 0.5	Naphthalene	< 1.0
Bromochloromethane	< 0.5	MTBE	< 1.0
n-Butylbenzene	< 0.5	n-Propylbenzene	< 0.5
sec-Butylbenzene	< 0.5	Styrene	< 0.5
tert-Butylbenzene	< 0.5	1,1,1,2-Tetrachloroethane	< 0.5
Carbon tetrachloride	< 0.5	1,1,2,2-Tetrachloroethane	< 1.0
Chlorobenzene	< 0.5	Tetrachloroethene	< 0.5
Chloroethane	< 0.5	Toluene	< 0.5
Chloromethane	< 0.5	1,2,3-Trichlorobenzene	< 0.5
2-Chlorotoluene	< 1.0	1,2,4-Trichlorobenzene	< 0.5
4-Chlorotoluene	< 1.0	1,1,1-Trichloroethane	< 0.5
Dibromomethane	< 1.0	1,1,2-Trichloroethane	< 0.5
Dichloromethane	< 1.0	Trichloroethene	< 0.5
1,2-Dichlorobenzene	< 0.5	Trichlorofluoromethane	< 1.0
1,3-Dichlorobenzene	< 0.5	1,2,3-Trichloropropane	< 0.5
1,4-Dichlorobenzene	< 0.5	1,2,4-Trimethylbenzene	< 0.5
1,2-Dichloroethane	< 0.5	1,3,5-Trimethylbenzene	< 0.5
1,1-Dichloroethane	< 0.5	Vinyl Chloride	< 0.5
1,1-Dichloroethene	< 0.5	Xylenes, Total	< 1.0
cis-1,2-Dichloroethene	< 0.5	Bromodichloromethane	< 0.5
trans-1,2-Dichloroethene	< 0.5	Chloroform	< 0.5
1,2-Dichloropropane	< 0.5	Dibromochloromethane	< 0.5
1,3-Dichloropropane	< 0.5	Dichlorodifluoromethane	< 0.5
2,2-Dichloropropane	< 0.5	Bromoform	< 0.5
1,1-Dichloropropene	< 0.5	Total Trihalomethanes	< 0.5
cis-1,3-Dichloropropene	< 0.5	Surrogate 1	96.0%
trans-1,3-Dichloropropene	< 0.5	Surrogate 2	84.0%
Ethylbenzene	< 0.5	UIP's	0.
Hexachlorobutadiene	< 0.5		





ENDYNE, INC.

Laboratory Services

160 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA 524.2

CLIENT: Ross Environ. Assoc., Inc.
PROJECT: Before UST/25-081
SITE: 420 School St
DATE RECEIVED: August 9, 2005
REPORT DATE: August 12, 2005
ANALYSIS DATE: August 11, 2005

ORDER ID: 39100
REFERENCE NUMBER: 257785
DATE SAMPLED: August 8, 2005
TIME SAMPLED: 11:15 AM
SAMPLER: BR/JG
ANALYST: 725

<u>Parameter</u>	<u>Result</u> <u>ug/L</u>	<u>Parameter</u>	<u>Result</u> <u>ug/L</u>
Benzene	< 0.5	Isopropylbenzene	< 0.5
Bromobenzene	< 0.5	4-Isopropyltoluene	< 0.5
Bromomethane	< 0.5	Naphthalene	< 1.0
Bromochloromethane	< 0.5	MTBE	< 1.0
n-Butylbenzene	< 0.5	n-Propylbenzene	< 0.5
sec-Butylbenzene	< 0.5	Styrene	< 0.5
tert-Butylbenzene	< 0.5	1,1,1,2-Tetrachloroethane	< 0.5
Carbon tetrachloride	< 0.5	1,1,2,2-Tetrachloroethane	< 1.0
Chlorobenzene	< 0.5	Tetrachloroethene	< 0.5
Chloroethane	< 0.5	Toluene	< 0.5
Chloromethane	< 0.5	1,2,3-Trichlorobenzene	< 0.5
2-Chlorotoluene	< 1.0	1,2,4-Trichlorobenzene	< 0.5
4-Chlorotoluene	< 1.0	1,1,1-Trichloroethane	< 0.5
Dibromomethane	< 1.0	1,1,2-Trichloroethane	< 0.5
Dichloromethane	< 1.0	Trichloroethene	< 0.5
1,2-Dichlorobenzene	< 0.5	Trichlorofluoromethane	< 1.0
1,3-Dichlorobenzene	< 0.5	1,2,3-Trichloropropane	< 0.5
1,4-Dichlorobenzene	< 0.5	1,2,4-Trimethylbenzene	< 0.5
1,1-Dichloroethane	< 0.5	1,3,5-Trimethylbenzene	< 0.5
1,2-Dichloroethane	< 0.5	Vinyl Chloride	< 0.5
1,1-Dichloroethene	< 0.5	Xylenes, Total	< 1.0
cis-1,2-Dichloroethene	< 0.5	Bromodichloromethane	< 0.5
trans-1,2-Dichloroethene	< 0.5	Chloroform	< 0.5
1,2-Dichloropropane	< 0.5	Dibromochloromethane	< 0.5
1,3-Dichloropropane	< 0.5	Dichlorodifluoromethane	< 0.5
2,2-Dichloropropane	< 0.5	Bromoform	< 0.5
1,1-Dichloropropene	< 0.5	Total Trihalomethanes	< 0.5
cis-1,3-Dichloropropene	< 0.5	Surrogate 1	97.0%
trans-1,3-Dichloropropene	< 0.5	Surrogate 2	86.0%
Ethylbenzene	< 0.5	UIP's	
Hexachlorobutadiene	< 0.5		



160 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

70048

(White, Yellow - Laboratory / Pink - Client)